OPPENHEIMER WOLFF & DONNELLY LLP Telephone No (650) 320-4000
Title: METHOD FOR FAST COMPILATION OF PREVERIFIED JAVA™ BYTECODE TO HIGH QUALITY NATIVE MACHINE CODE
Inventor(s): Beat Heeb
Attorney Docket No.: 20296-300201
Application No . 10/014,742 Sheet 1 of 5
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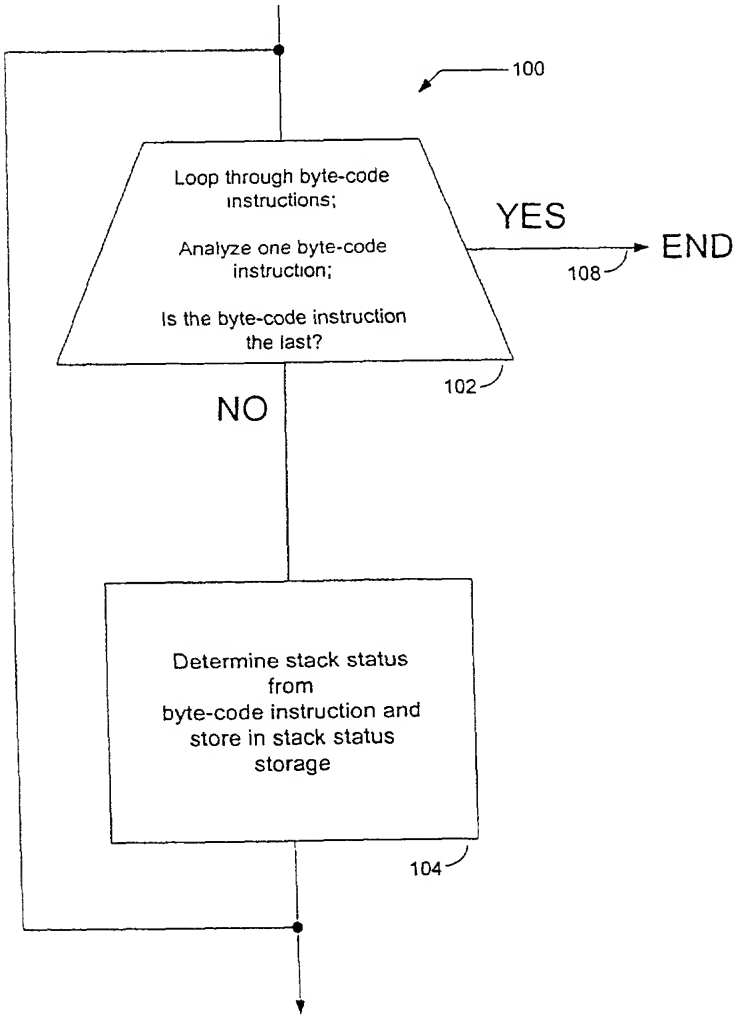
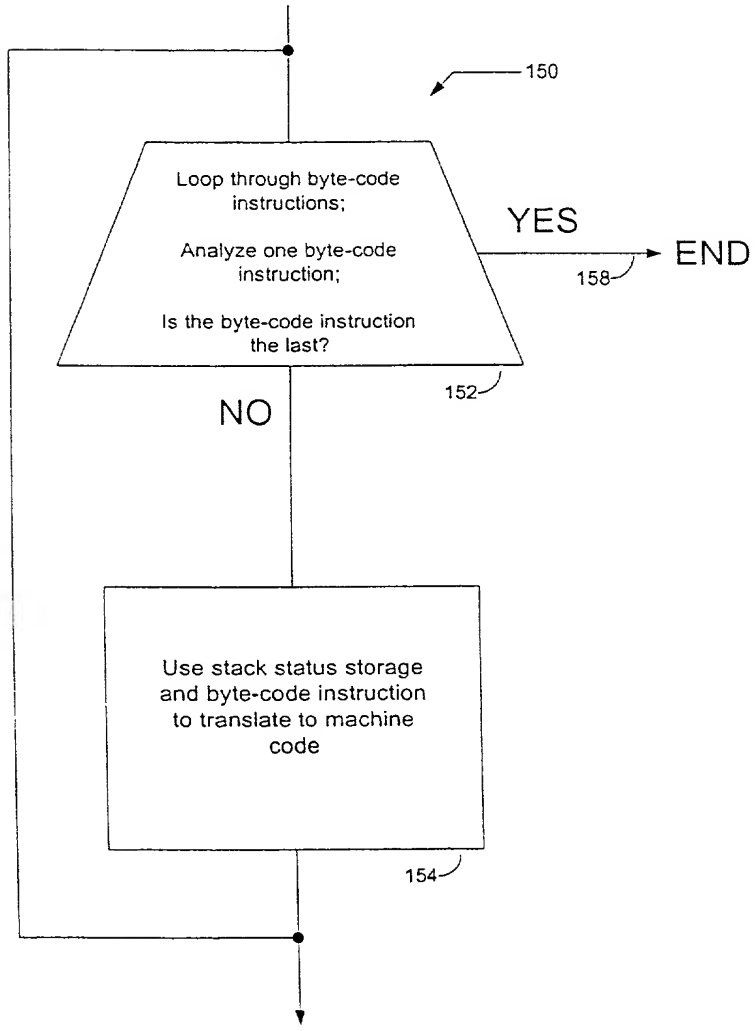


Traditional Byte-Code Compilation

Pass 1

FIGURE 1A

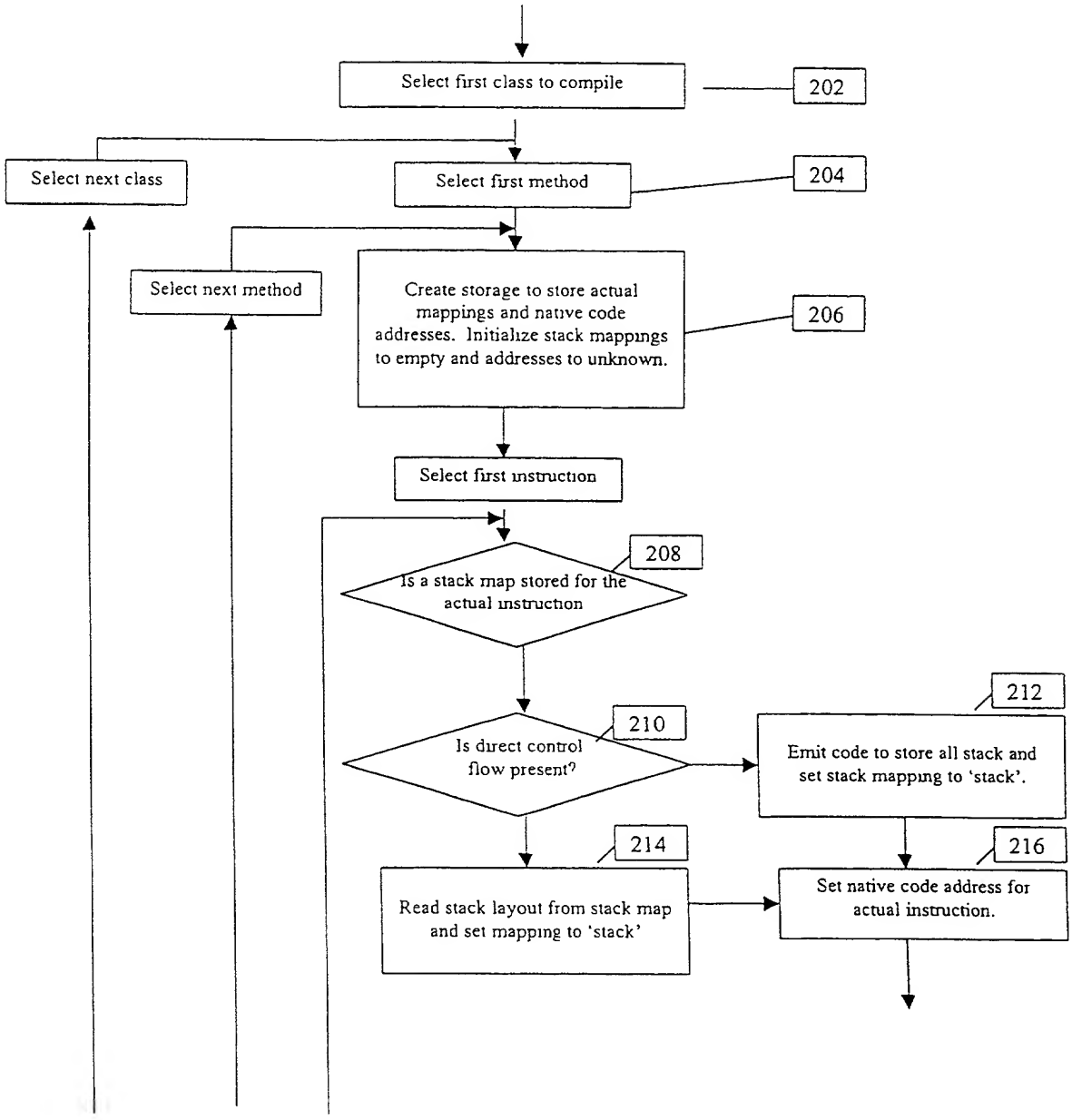


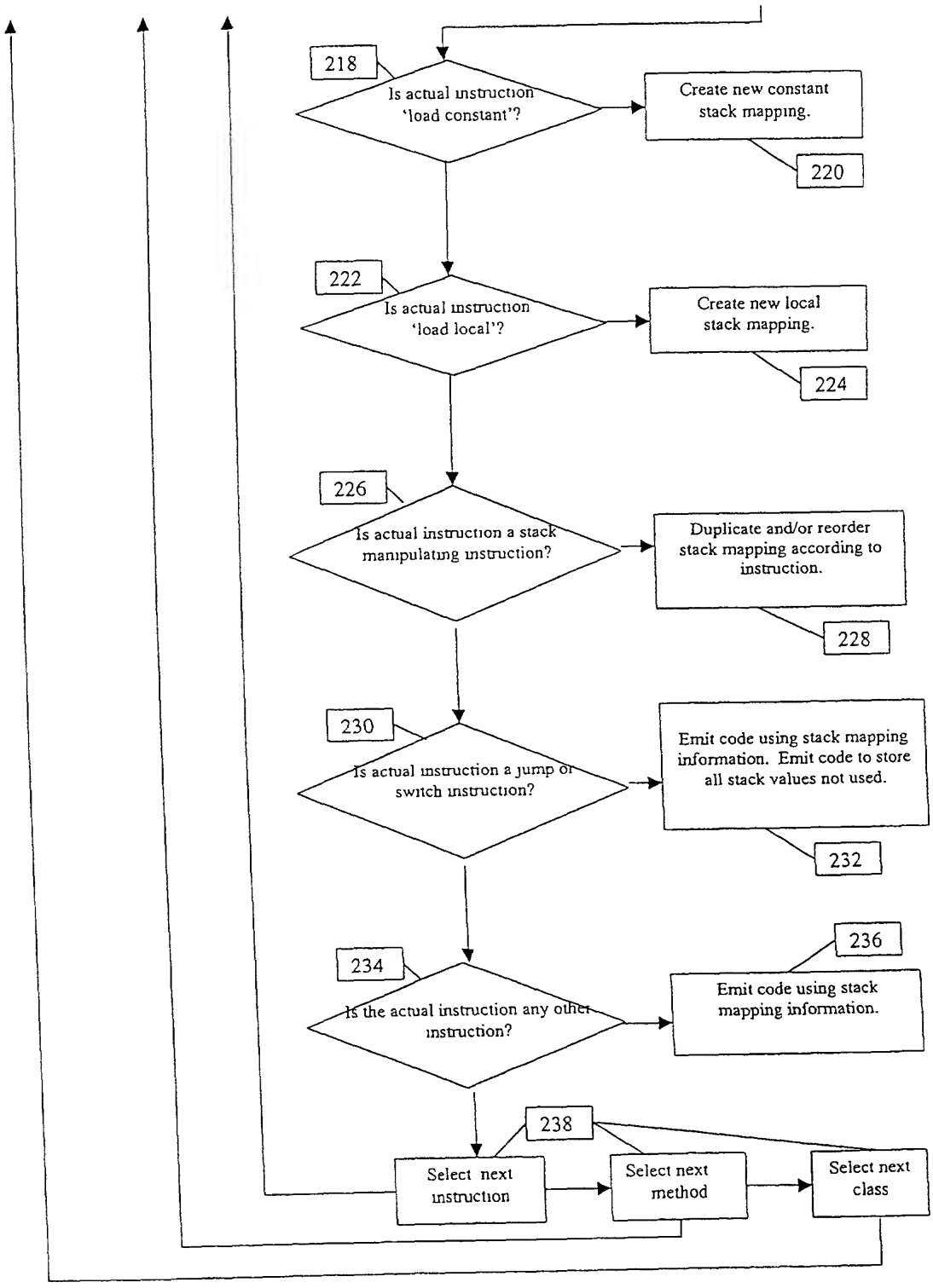
Traditional Byte-Code Compilation

Pass 2

FIGURE 1B

FIGURE 2


Select first class to compile
202
Select next class
Select first method
204
Select next method
Create storage to store actual mappings and native code addresses. Initialize stack mappings to empty and addresses to unknown.
206
Select first instruction
208
Is a stack map stored for the actual instruction
210
Is direct control flow present?
212
Emit code to store all stack and set stack mapping to 'stack'.
214
Read stack layout from stack map and set mapping to 'stack'
216
Set native code address for actual instruction.


218
Is actual instruction 'load constant'?
Create new constant stack mapping.
220
222
Is actual instruction 'load local'?
Create new local stack mapping.
224
226
Is actual instruction a stack manipulating instruction?
Duplicate and/or reorder stack mapping according to instruction.
228
230
Is actual instruction a jump or switch instruction?
Emit code using stack mapping information. Emit code to store all stack values not used.
232
234
Is the actual instruction any other instruction?
236
Emit code using stack mapping information.
238
Select next instruction
Select next method
Select next class

Arrays of Fixed Size

For each value on the bytecode stack	A field showing actual mapping to storage in target machine	constant
		local
		temporary
		stack
	A field containing additional information	constant value
		slot number
		register number
For each target of a jump or switch instruction	A field to store native code address	

Required Data Structures

FIGURE 3

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